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ON *COPELATUS* ER. AND *LEIOPTERUS* STEPH. (COL. DYTISCIDAE) WITH DESCRIPTIONS OF NEW SPECIES

By J. Balfour-Browne, M.A.

(*Formerly Frank Smart Student (Zoology), Cambridge.*)

(Read 1st June, 1938.)

With Fourteen Figures.

The genus *Copelatus* was separated from *Agabus* by Erichson (1832) to include *Dytiscus posticatus* Fab., and two other unnamed American species, so that *D. posticatus* is therefore the genotype. The separation was based on the character of the ciliation of the posterior legs, *Copelatus* having the ciliation above and below in both sexes, while only the males of *Agabus* show this development. Erichson divided *Agabus* into three "*familia*," based partly on the form of the anterior tarsi of the males, I and II having the three basal segments more or less dilated and compressed, III having these segments definitely dilated and depressed; this last group included *Dyticus oblongus* Ill.

Dejean's *Catalogue* (1833) ignores *Copelatus* and includes *D. posticatus* in *Colymbetes*; it separates *Agabus* fam. I (*Agabus serricornis* Payk.), from fams. II and III, placing *D. arcticus* Payk. in *Colymbetes* and creating a new genus *Liopterus* for *D. oblongus* Ill.

By a ruling of the International Congress of Zoology in 1927, when it adopted a recommendation of the International Commission on Zoological Nomenclature, a genus published between 1st January 1758 and 31st December 1930 is valid even if no word of description or diagnosis accompanies it, so long as it contains one or more recognisable species (*vide* Hemming, 1934). According to this ruling Dejean's publication of the genus *Liopterus* is valid, and cannot be disregarded.

The second edition of Dejean's *Catalogue* was issued in January 1833 (*vide* Griffin, 1932). A curculionid genus, *Leiopterus*, was published by Schönherr (1833), but since neither the genus nor the sole species cited was described the name is a *nomen nudum*. In the second edition of his *Nomenclature*, published in 1833, Stephens uses the subgeneric name *Liopterus* for sp. 9. *oblongus* Ill., and sp. 10. *arcticus* Payk.

A committee of the Royal Entomological Society of London is still considering whether to apply to the International Commission on Zoological Nomenclature for the annulment of Dejean's *Catalogue* for taxonomic purposes. For the present, therefore, I am ignoring this work. The next publication of *Liopterus* is by Stephens, who, in April 1833, issued the second edition of the *Nomenclature of British Insects*. This citation must also be set aside as it does not accord with Opinion 1 on Article 25 of the International Code of Zoological Nomenclature.

I am, therefore, in agreement with Méquignon (1937) that *Leiopterus* (not *Liopterus*) is to be ascribed to Stephens, who published this name, with a diagnosis, in March 1835. However, Méquignon gives as subgenotype *Dytiscus oblongus* Illiger 1798 = *ruficollis* Schaller 1783. Schaller's name is preoccupied by the *Dytiscus ruficollis* Degeer 1774 (which is an *Haliplus*) and there is no mention of

oblongus in *Verz. Käf. Preussens* of Illiger 1798 under *Dyticus*. The species was described in 1802 *Mag. Insektenk.* **1** : 72 as *Dyticus* and the synonyms given by Zimmermann (1920) include *haemorrhoidalis* Fabricius 1787 and *agilis* Fabricius 1792. Erichson (1837) said he had seen Fabricius' specimens and they are *oblongus* Ill.; *haemorrhoidalis* Fab. has five years priority and the subgenotype should therefore be *Dytiscus haemorrhoidalis* Fab. 1787 (*ruficollis* Schaller 1783 [*nec* Degeer 1774], *agilis* Fab. 1792, *oblongus* Ill. 1802, ? *schalleri* Gmel. 1790).

In the Appendix to volume V of *British Entomology*, Mandibulata, dated 31st March 1835, the name is spelt *Leiopterus* and a diagnosis is given. This is here taken as the first valid use of the name. Stephens stated that his subdivisions of *Colymbetes* are taken from continental authors (*i.e.* Dejean's *Catalogue*).

Boisduval and Lacordaire (1835, probably September, *vide* Méquignon 1937) separated *Rantus* from *Colymbetes* (which included the modern genera *Agabus* and *Ilybius*) and took Dejean's name for a subgenus distinguished from *Rantus* s.str. by having equal anterior tarsal claws in the male. The subgenus *Liopterus* of Boisduval and Lacordaire included two species, *oblongus* Ill. and " *notatus* Fab." This *notatus* cannot be the Fabrician species since it is much too large, nor can it be, as Zimmermann (1920) stated, a synonym of *Colymbetes pulverosus* Steph. since that species has unequal anterior tarsal claws in the male. The description, apart from indicating a typical *Rantus*, is not of assistance in identifying the species; there remains the single species *D. oblongus* Ill., selected as type by Hope (1839).

Aubé (1836) retained Erichson's genus *Copelatus*, and also retained *D. oblongus* in *Agabus*, but made it the sole member of *Liopterus*, taken from Dejean, to which he gave subgeneric rank. He separated *Liopterus* from *Colymbetes* by the character of the male tarsi, which have the three basal segments transversely dilated in *Liopterus* and compressed in *Colymbetes*. In both his publications of (1836) and (1838) Aubé remarked on the difficulty of separating *Agabus* and *Copelatus* if the striae are excluded from consideration, since they cannot be taken for a generic character.

Stephens (1839) retained *D. agilis* Fabr. (which he considered as synonymous with *D. oblongus* Ill.) and *D. arcticus* Payk. together in a separate genus, *Leiopterus*, which he ascribed to Eschscholtz, distinct from *Rantus* by characters of the palpi, and from *Agabus* by form.

Régimbart (1878) recognised *Liopterus* of Aubé and *Copelatus* Er. as distinct genera, separated them in a diagnostic table by absence or presence of elytral striae.

Sharp (1882) first demonstrated the true generic character of *Copelatus*, separating it from *Agabus* by the course of the metacoxal sutures. He ignored the name *Liopterus*, and divided the genus *Copelatus* into fourteen groups on the arbitrary character of absence, or presence of, elytral striae and their number when present.

Authors subsequent to Sharp, except Régimbart in his later papers, have regarded Sharp's group I and *Liopterus* as synonymous, and Zimmermann (1917) endeavoured to support this synonymy by the form of the anterior tibiae of the male.

Balfour-Browne (F.) (1935) is in error in supposing that Aubé " made the subgenus *Liopterus* to include those species with smooth elytra," since, until Sharp, the subgenus never had any relationship with *Copelatus*.

Zimmermann's attempt to give the subgenus validity is subject to the objection that it is based on a sexual character. Zimmermann (1917) himself

recorded an exception and to get over it he created an additional group. In fact the subgenus is untenable, as none of the characters adduced for it stands examination. The character of presence or absence of elytral striae, cannot be used to support even a subgeneric distinction, since most of the neotropical species of the first group are sexually dimorphic, the males completely estriate, the females imperfectly striate. The name *Leiopterus* Stephens must therefore fall as a synonym of *Copelatus* Erichson.

The usages of the name *Leiopterus* or *Liopterus* discussed above are given in the following list, with genotypes where possible. Those appearing in Catalogues are marked (Cat.). In recapitulation usages 1 and 2 are not in accordance with Opinion 1 on article 25 of the International Code of Zoological Nomenclature and are regarded as *nomina nuda* and the first valid use of the name is that of Stephens 1835.

Value.	Name.	Author.	Date.	Genotype.
1. (Genus)	*Liopterus*	Dejean	Jan. 1833 (Cat.)	*Dyticus oblongus* Ill.
2. (Genus)	*Liopterus*	Stephens	Apr. 1833 (Cat.)	
3. (*Colymbetes* subg.)	*Leiopterus*	Stephens	Mar. 1835	
4. (*Rantus* subg.)	*Liopterus*	Lacordaire	Sep. 1835	
5. (*Agabus* subg.)	*Liopterus*	Aubé	1836	*Dyticus oblongus* Ill.
6. (*Colymbetes* subg.)	*Leiopterus*	Stephens	1839	
7. (Genus)	*Liopterus*	Hope	1839	*Dyticus oblongus* Ill.
8. (Genus)	*Liopterus*	Régimbart	1878	
9. (Group)	*Copelatus* Gp. 1	Sharp	1882	
10. (*Copelatus* subg.)	*Liopterus*	Zimmermann	1920 (Cat.)	
		Méquignon	1937	

Balfour-Browne (F.) (1934) has noted a difference in the form of the proventriculus between certain estriate and striate species and this may indicate a fundamental distinction. However, only six species have been examined out of a total of upwards of two hundred and thirty species known and it is therefore too early yet to base any grade of distinction on this character.

An exhaustive examination of the external characters of the genus, of which I have seen about 200 species, has convinced me that it is a quite homogeneous aggregate and that Sharp's group divisions (although, as he admits, they cross the natural relationships of the species) are still of the greatest use in determination, in spite of the increase of 250% in the numbers of species known, although the distinctions between the groups are perhaps less clear now than when they were defined.

The greatest approximation comes between groups III and X, particularly in certain African and Indian species. *C. ragazzii* Rég. was placed in group III and *C. aethiopicus* Rég. in group X : of the latter species Régimbart remarks that the submarginal stria may occasionally be absent, which would place the species in group III; of the former species certain specimens in the National Collection named by Régimbart "*ragazzii* var." possess a distinct though short submarginal stria, which places the species in group X.

A similar feature occurs in *C. fidschiensis* Zimm. (*Wien. ent. Ztg* **44** : 173), which may belong to either group III or group X.

Another approximation occurs between *C. nilgiricus* sp. n. and *C. discoideus* Sharp (*loc. cit.* : 582), the absence of the submarginal stria in the former and its smaller size being the most evident distinction.

Sharp has already (*loc. cit.* : 203) remarked on the approximation between *C. interruptus* Perr. of group VII and *C. aubei* Montr. of group XIV, both species being from the same locality. The approximation between *C. cheesmanae* sp. n. and *C. aubei* is even closer, the former possessing a much broken or punctiform submarginal stria, so that it is a matter of opinion whether the species should not be included in group XIV.

The presence of a submarginal stria is sometimes open to argument, since in certain cases it is reduced to one or two elongate punctures. Such a case is exemplified in *C. incognitus* Sharp in which there is a single deep, slightly elongate, puncture, described by Sharp as " stria marginali aegre discernenda." In what I believe to be the male of this species (see p. 75) there is no sign of this puncture or stria, and I am unable to accept Sharp's description in this particular, since to my mind there is no true submarginal stria in the sense of groups VIII to XIV.

There is no doubt in my mind that Sharp is correct in rejecting the hypothesis that the striae of the genus *Copelatus* have been developed for the purpose of directing the claws of the male to their proper positions during copulation : there appears no possibility of this function being fulfilled, and, as Sharp points out, the development of equally strong and deep striae in the male sex is not accounted for by any such hypothesis. In both estriate and striate species there is a fairly general development of a true sexual sculpture in the female sex : in the more profusely strigulated species there is a decided tendency for the sexual sculpture to obliterate the striae, which might be taken as an indication that the striation is a hindrance rather than a help to the perpetuation of the species.

The simplest assumption to make is that the striae are arrived at by a simple elongation of the series of linear punctures characteristic of the elytra of the Dytiscidae. Examples of this hypothesis may be seen in *C. fryi* sp. n. and in groups VII and XIV. From this it is an easy step to the assumption that the development of the striation from such a form to the strong, deep, entire striae of such a form as *C. sulcipennis* Cast. is a development of ornamentation pure and simple.

It is more difficult to accept the statement of Sharp (*loc. cit.* : 203) that each species has had a truly separate line of development, and that by a subtraction of what he called the " later acquisitions of striation " one would find the striation in a rudimentary form similar to, but not identical with, that of other species. In addition to the two species mentioned by him there are now two further species known (*C. cheesmanae* sp. n. and *C. striolatus* sp. n.), of which the former is very much more similar to *C. aubei* Montr. than is *C. interruptus* Perr. I have little doubt that *C. cheesmanae* and *C. aubei* are descendants of a common ancestor, and I regard the specific differences as being due to environmental causes in geographically separated habitats. The transition from *C. interruptus* to *C. cheesmanae* could be easily bridged by a progressive development of the striation, and in the reverse direction by a progressive decrease in striation, the *C. striolatus* form is arrived at. The suggestion of separate lines of development for each of these species is therefore quite unnecessary, and the development of *C. aubei* from a *C. striolatus* ancestral form is capable of a simple and probable explanation. The same argument could equally be applied to the development of similar groups of species, as between groups III and X, and the

same conclusion is attained. The striation is subject to considerable variation, and the submarginal stria in particular is not a constant stria, but even if it were it is not necessary to invoke a different line of development for species in groups 1–7 and 8–14.

In its present state of organisation the systematics of species within the genus are undoubtedly unsatisfactory. There is little doubt in my mind that many so-called species should be submerged in species-groups, and that some so-called species are *species in statu nascendi*. The conclusion I have reached from an extensive study of the genus is that there are a number of plastic groups of species, *e.g.* the *C. pulchellus* (Klug) Aubé-group and the *C. erichsoni* Guér.-group, in which one parent species is surrounded by several forms at varying stages in the process of evolution into distinct species, but that their present state of development has not yet produced the distinctive characters which I might term the " hall-mark " of specificity.

In theory there should be areas where the environment induces variation, and in these areas evolutionary trends would appear. So long as these areas are not isolated by unsurpassable barriers they would be subjected to an influx from the neighbouring more stable areas which would, by interbreeding, slow down the trends towards the development of distinct specific characters. Recently Warren (1937) has shown that there are, in the genus *Erebia* (Lepidoptera), quite small localised areas where subspecies and forms flourish, apparently unaffected by the presence of the parent species and other subspecies in the surrounding area. Our knowledge of the conditions governing flight in the aquatic insects is very fragmentary, but it is not impossible that very little of the postulated influx takes place in nature, at least on a scale capable of swamping out evolutionary trends. Our knowledge of the real distribution of the forms and subspecies of the *C. pulchellus*-group, for example, is far from complete, and it is not possible to assert that the presence of two forms in the same locality is uncommon. However, a parallel case is seen in the genus *Deronectes* (*Potamonectes*). There are three forms,* *D. depressus* F., *D. elegans* Panz., and *D. sansi* Aubé, which are easily recognised in their extreme forms, but appear to grade into one another completely by intermediate forms. The two former are found in Britain but have very rarely been discovered in the same locality. If one is justified in assuming that the same fact may be true of plastic groups, or what have been called " composite species " (Balfour-Browne (F.), 1932), in other genera and families, it is evident that the specific limits are vaguer than has been assumed. This may appear natural if the problem is examined from another angle, viz. : that of continuous evolution. From this point of view those species which are sharply defined may be the end points of evolutionary lines; those which form plastic groups are the earlier stages in an evolutionary line. From this it appears that the sharply defined species are ultimately destined for extinction, since the organism has lost the plasticity which leads to adaptive development to suit the constantly altering environment, whereas the composite species, by the plasticity of the organism, are maintaining their position vis-à-vis the changes in the environment. From these composite species forms will develop which will, in turn, either lose or

* A fourth species—*D. latescens*—has recently been added to this complex (*see* Falkenström, 1932, *Ent. Tidskr.* **53** : 191, 192), which Falkenström separated from the *D. depressus–elegans* pair. I am quite unable to recognise this species from the description, and agree with the remarks of my father (*see* 1934, *Scot. Nat.* **1934** : 41–49), that there is nothing in the publications of Falkenström on this complex which can be said to prove his contention as to the specific validity of these forms.

retain the plasticity which ensures continuity. It does not, of course, follow that species apparently at the end point of evolutionary lines may not undergo a sudden regeneration of the plasticity under some stimulus, possibly a large change in the environment.

Seen in the light of the suggestions made above, the genus *Copelatus*, rich in plastic groups, is a very actively evolving genus, and in view of the very large range of distribution of some of its forms, it must remain a problem in specific systematics. I have found the most serious handicap to effective treatment to lie in the paucity of material of the more complex groups, and this must remain the systematists' difficulty for a long time to come. Until the material available reaches really generous proportions, it will remain very largely a matter of personal opinion as to where the limits of specific validity lie.

I have to thank Dr. Hugh Scott of the Department of Entomology of the British Museum (Natural History) for much helpful advice during the preparation of this paper. Thanks are also due to my father, Prof. Frank Balfour-Browne, for advice and criticism of the typescript.

My best thanks are due to Mr. N. D. Riley, Keeper of the Department of Entomology in the British Museum, for permitting me to carry out the work involved in the preparation of this paper in the collections under his charge. The types of all new species are deposited in the British Museum.

For convenience, Sharp's group diagnosis is here repeated :—

No submarginal stria on elytra.	and without any true entire striae	1.
	but with 3, 4, or 5 true striae	2.
	with 6 striae	3.
	with 8 striae	4.
	with 10 striae	5.
	with 11 striae	6.
	with 12 striae	7.
A submarginal stria on each elytron.	and with 2 other striae	8.
	and with 5 other striae	9.
	and with 6 other striae	10.
	and with 7 or 8 other striae	11.
	and with 9 or 10 other striae	12.
	and with 11 other striae	13.
	and with 12 other striae	14.

Copelatus novae-caledoniae nom. n. group 1.

C. hydroporoides Sharp, 1882, *Trans. R. Dublin Soc.* (2) **2** : 564. (*nec* Murray) **syn. n.**

Murray first described his species as an *Agabus*, but subsequently placed it in *Celina*. The unique individual has been examined and it proves to be a typical *Copelatus* of group I (see p. 62), closely related to *C. gardineri* Scott (1912, *Trans. linn. Soc. Lond.* **15** : 257). Sharp's species was described 21 years after Murray's description was published, and I therefore propose the name *C. novae-caledoniae* for Sharp's species.

Copelatus erraticus nom. n. group 1.

C. victoriae Sharp, 1882, *loc. cit.* : 564. (*nec* Clark) **syn. n.**

4½–5 mm. long : 2–2⅝ mm. lat.

Elongato-ovalis, angustus, minus depressus, haud parallellus, pone medium latior, ferrugineus, elytris testaceis, subtus nigricans, elytris seriebus tribus punctorum sat distinctis, versus

apicem strigulis transversis brevibus minus distinctis, leviter impressis. Mas, segmentibus tribus basalibus tarsorum anteriorum intermediorumque leviter dilatatis.

Head ferruginous, behind the eyes vaguely infuscate; the surface lightly but closely reticulate, and with a scattered weakly impressed punctation. Thorax ferruginous, the disc vaguely infuscate; posterior angles rectangular, with a few slightly elongate punctures. Elytra testaceous with a fine dark line along the suture. The three serial rows of punctures are clearly visible, consisting of moderately strong, irregularly spaced punctures. The entire surface is covered with a barely impressed reticulation, and a widely scattered very finely impressed punctation. Towards the apex there is an area of widely spaced fine strioles, quite transverse, and very shallowly impressed, so that they are visible only under a high magnification.

The female has the short punctiform strioles of the posterior pronotal angles more strongly impressed and perhaps more numerous than the male. The anterior tarsal claws of the male are slightly unlike. The inner is almost straight, the lower edge weakly bisinuate, and only the extreme apex curved to a point; the outer claw is simple, less strongly curved than in the female.

This species is very closely related to *C. ferrugineus* Sharp (*loc. cit.*: 565) and *C. lividus* Sharp (*loc. cit.*: 565) which it resembles in the possession of the transverse strioles of the posterior part of the elytra. It is distinct from *C. ferrugineus* by the less impressed strioles, and from *C. lividus* by the smaller size and the less striolate posterior pronotal angles.

This species was wrongly identified by Sharp with *C. victoriae* Clark, and therefore requires a new name.

Copelatus victoriae Clark. group 1.

C. victoriae Clark, 1863, *J. Ent.* **2**: 22.
C. labratus Sharp, 1882, *loc. cit.*: 565. **syn. n.**

With regard to this species, it should be remarked that there were two specimens bearing labels in Clark's handwriting, one, in addition, bearing a British Museum type label. The two specimens were of distinct species, and the authenticity of the type is somewhat doubtful. The chief evidence would seem to lie in the colour of the labels used by Clark, since the inscription on both is "*Cop. victoriae* Clark." One label is square and white, the other oblong and blue. Of other species in the same genus which were described at the same time, *C. simplex* and *C. australiae* are represented by two specimens each, one of which bears a white label, the other a blue label; *C. australis* and *C. acuductus* are each represented by single specimens, and each is labelled on white. It would seem therefore that the white labels indicate the holotype specimen in each case. In support of this assumption the description indicates a species resembling *C. simplex*, and the white labelled specimen belongs to that group. Against this, the length given in the description is $2\frac{1}{3}$ lines, whereas the white labelled specimen is $2\frac{3}{4}$ lines, or the same length as *C. simplex*, not "decidedly smaller in size" as the description states. The length of the specimen bearing the oblong blue label is exactly $2\frac{1}{3}$ lines, but it belongs to a different group of species, and is not in the *C. simplex* group.

Clark's description suits the specimen bearing the white label in everything except the length, and on that account, taking into consideration the other external evidence of identity, I suggest that that specimen should be considered the holotype, and the description should be amended to read, "length $5\frac{1}{2}$ mm. width $2\frac{3}{4}$ mm."

C. labratus Sharp is represented by two specimens, both females, one of which also bears a label "*victoriae* Clark" in writing which is possibly Clark's. Both specimens agree completely with the type of *C. victoriae* Clark, as it is defined above, and the name *labratus* must therefore become a synonym.

The second of Clark's specimens discussed in the foregoing is a specimen of *C. erraticus*, which was Sharp's conception of *C. victoriae* Clark, but has been redescribed above (p. 62).

Copelatus tarsalis sp. n. group 1.

8¾ mm. long : 4 mm. lat.

♂. *Oblongo-ovalis, elongatus, minus depressus, nigricans, piceus, capite antice posticeque et prothorace ad latera rufescentibus, antennis pedibusque rufis ; prothorace strigulis brevibus densis instructo, in medio minus distinctis ; elytris fere sine seriebus punctorum, strigulis brevibus rudis numerosis, versus apicem desinentibus necnon longius extensis ; unguiculis anticis tenuis, anteriore fere recto, subtus leviter sinuato ; posteriore leviter curvato.* ♀ *ignota.*

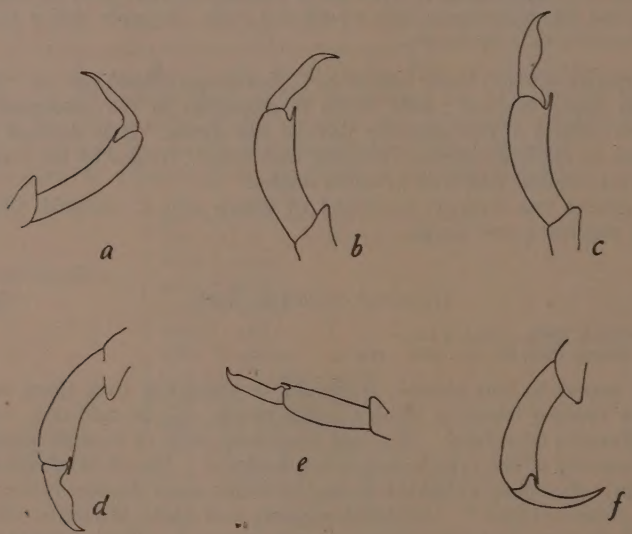

FIG. 1.—Anterior (inner) tarsal claw of the male: (a) *tarsalis* sp. n.; (b) *melanarius* Sharp; (c) *extensus* Sharp; (d) *australiae* Clark; (e) *ater* Sharp; (f) *aculeatus* Clark.

Head rufo-piceous with a broad black band between the eyes. Pronotum blackish, rufo-piceous towards the sides, strongly and comparatively densely covered with short deep strioles, the disc less densely and less distinctly. Elytra blackish piceous, the anterior two-thirds covered with short deep strioles, the serial rows of punctures almost invisible: posterior third smooth.

The anterior tarsal claws are weak: the inner almost straight above, only the apex gently curved, weakly sinuate below; the outer claw gently curved from base to apex.

♂ holotype, SOUTH AUSTRALIA: Melbourne, Sharp coll. (British Museum, 1905–313).

This species (of the *C. ater* group) was determined by Sharp as *C. aculeatus*

Clark, but it appears to me quite distinct therefrom. The stronger, denser, and deeper strigulation of the pronotum and elytra, the absence of the strioles from the apical third of the elytra, and the much weaker, differently shaped anterior claws readily distinguish it. It is remarkable that Sharp, who made use of the character of the claws in separating the species of this group, should have passed over this specimen. The colour is very similar to that of *C. acuductus*, and in particular to one female, which may possibly be *C. tarsalis* sp. n., but it has the strigulation continued to the apex of the elytra, and not stronger than in a female of *C. acuductus* in Clark's collection.

Copelatus atripennis sp. n. group 1.

6¼–6¾ mm. long : 2⅘–3⅕ mm. lat.

Ovalis, sat angustus et elongatus, subdepressus, niger, sublaevigatus ; capite antice posticeque, prothorace angulis anterioribus, antennis pedibusque sordide rufis : elytris nigris, apicibus nigro-piceis, seriebus punctorum tribus vel quattuor sat distinctis : mas, articulis tribus basalibus tarsorum anteriorum intermediorumque vix dilatatis, unguiculis anticis simplicis.

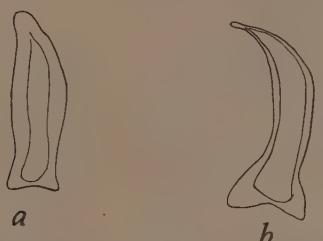

Fig. 2.—Aedeagus (dorsal view) of *C. atripennis* sp. n. (a) and *C. bimaculatus* Perr. (b).

Shining black, a fine, barely impressed reticulation over the whole dorsal surface. The anterior border of the head, a bifoveolate mark on the vertex and the anterior pronotal angles, reddish. The elytra black, rather piceous towards the apex, with two main series of punctures and two subsidiary rows, one between the main series, the other outside, less clear, composed of fewer punctures set farther apart : the entire dorsal surface covered with a fine, somewhat sparse punctation. The male scarcely distinct from the female, the anterior and intermediate tarsi having the three basal segments scarcely dilated.

♂ holotype, ♀ allotype, 1 ♂, 1 ♀ paratypes. New Caledonia : Pampai, 15.ix.1914, *P. D. Montague* (British Museum 1918–87).

A new species very close to *C. bimaculatus* Perr. (1864, *Ann. Soc. linn. Lyons* **2** : 78) (= *C. subjectus* Sharp), very similar in size, form and sculpture, but differing in colour and in the form of the aedeagus, which is broader throughout its length and much less curved in its apical part, the apex more bluntly rounded (fig. 2).

Copelatus nomax sp. n. group 1.

4 mm. long : 2 mm. lat.

♀. *Elliptico-ovalis, minus depressus, nitidus, niger ; capite prothoraceque rufis, illo medio late infuscato ; elytris nigris, apicibus rufescentibus ; antennis pedibusque rufo-testaceis. Mas ignotus.*

Head reddish, narrowly black around the eyes. Thorax reddish, the disc largely but vaguely infuscate. Elytra black, the extreme apex very obscurely reddish. The whole surface lightly but shallowly reticulate and shining; a copious punctation, very fine and dense, over the whole dorsal surface, rather more strongly impressed and visible on the head. The serial punctures of the elytra consisting of irregularly spaced groups of two or three sharply impressed punctures. Beneath, infuscate reddish, the prosternum and the posterior abdominal segments reddish. Antennae and legs reddish testaceous.

♀ holotype (unique). Papua: Mafulu, 4000 ft., i.1934, *Miss Cheesman* (British Museum, 1934–321).

It is possible, but I think improbable, that this species is the female of *C. politus* Sharp (*loc. cit.*: 568) known only as a unique male from New Guinea. The species are similar in size, but the form is different, *C. nomax* being more convex and elliptical rather than oblong, and the surface is less shining (the latter possibly a sexual character). These two species are obviously closely related, as is also the next species, *C. atratus* sp. n., also from New Guinea.

Copelatus atratus sp. n. group 1.

4⅝–5 mm. long: 2–2¼ mm. lat.

Elongato-ovalis, subdepressus, nitidus, fere laevis; capite rufescente, in medio plus minus infuscato; thorace versus margines late rufescente; elytris atris; subtus, antennis pedibusque rufo-testaceis, segmentibus posticis abdominis nigricantibus. Tibiis anticis maris simplicis, segmentibus tribus basalibus tarsorum anteriorum intermediorumque vix dilatatis.

Head rufescent, the frons varying from quite black to slightly infuscate, the vertex pale rufous, bifoveolate. The thorax black, the anterior angles and the lateral margins to a greater or less extent rufescent, the posterior margin in the scutellar region somewhat reddish. Elytra jet black, the epipleura rufescent; the serial punctures clearly and deeply impressed, irregularly spaced. Beneath reddish testaceous, the penultimate and ultimate abdominal segments blackish. Antennae and legs reddish testaceous. The whole dorsum almost shining, the reticulation of the head, thorax and elytra shallow; an obscure, fine, and sparse punctation over the whole dorsal surface, clearer on the head and the pronotum. Beneath with the metacoxae having rather coarse oblique rugose striae. Anterior and intermediate tarsi of the male with the three basal segments scarcely dilated; the anterior tibiae simple, unemarginate at the base internally.

♂ holotype, ♀ allotype, 8 ♂♂, 1 ♀ paratypes. Papua: Kokoda, 1200 ft. ("under stones, riverside"). *Miss Cheesman* (British Museum, 1933–427; 1933–577).

Copelatus hydroporoïdes (Murray). group 1.

Agabus hydroporoïdes Murray, 1859, *Ann. Mag. nat. Hist.* (3) **4**: 120.
Celina hydroporoïdes Murray, 1867, *loc. cit.* (3) **19**: 179.

An examination of the type and only known specimen of this species reveals that it is a typical male example of an African group I *Copelatus*. Murray first published the species as an *Agabus*, but subsequently corrected its position, on the erroneous determination of the anterior tarsi as tetramerous, and placed the species in the genus *Celina*. In fact, all the tarsi are pentamerous: the error doubtless arose from the fact that the three basal segments of the protarsi are dilated, the fourth short and simple, the fifth long. The description also requires amending with regard to the protibiae, which show a strong, deep emargination within at the base.

The species has a close similarity to *C. gardineri* Scott (*loc. cit.*) of the Seychelles, but it is smaller and the reticulation of the dorsal surface is slightly coarser; it also lacks the sparse short longitudinal strioles at the posterior angles of the pronotum. It is a member of the *C. elongatus* Kolbe group of species, which includes seven of the eight Ethiopian species of group I. The eighth, *C. ferruginicollis* Rég. (1895, *Mém. Soc. ent. Belg.* **4** : 157), is isolated.

Copelatus insolitus Chevr. group 1.

C. insolitus Chevr., 1863, *Ann. Soc. ent. Fr.* (4) **3** : 201.

A single male specimen from Chile (coll. Kraatz) bears a label "Copelatus seriatopunctatus Rég. n. sp. type" in the handwriting of Régimbart. The name is apparently unpublished. Comparison with a male in the Sharp collection which bears on the card "*Copelatus insolitus* 'Type ex coll. Chevrolat'" leaves no doubt that it is a second specimen of this species. The agreement in form and sculpture is so close that the small difference in colour can have no significance, and Régimbart's proposed name is unnecessary. The type is from Cuba. The Chilean locality would appear to indicate that the species is widely spread throughout South America, but it appears to be very rare in collections.

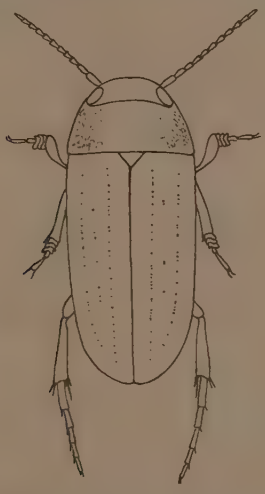

FIG. 3.—*Copelatus biseriatus* sp. n. ♂.

Copelatus biseriatus (Rég. in litt.) sp. n. group 1.

4½–4¾ mm. long : 2¼ mm. lat.

Oblongus, angustus, parallellus, subdepressus, testaceus, omnino tenuissime punctulatus, seriebus punctorum elytrorum distinctis, elytris maculâ obscurâ transversâ subbasale. Mas, articulis tribus basalibus tarsorum anteriorum intermediorumque transversis et dilatatis; tibiis anticis intus ad basin emarginatis.

Head and pronotum clear testaceous, elytra smoky testaceous with an obscure narrow transverse basal fascia of paler colour. The whole dorsal surface closely covered with a fine, lightly impressed punctation. The disc of the pronotum almost shining, the punctation

effaced, laterally the fine punctation becoming elongate, finely striolate, more widely in the female than in the male. The serial elytral punctures finely but sharply and clearly impressed. Beneath clear testaceous. The anterior tibiae of the male strongly and sharply emarginate within at the base; the three basal segments of the anterior and intermediate tarsi strongly dilated, almost transverse; the fourth segment simple and short, the fifth simple and long, about as long as the first, second and third segments together. Antennae in both sexes long.

This species bears a label with this name in Régimbart's handwriting, but the name appears to be unpublished.

♂ holotype, ♀ allotype. e coll. Bates, Amazon (British Museum, 67–56).

This species appears to be most nearly related to *C. insolitus* Chevr., but it is rather smaller, and decidedly narrower and more parallel sided, the emargination of the base of the anterior tibiae of the male is also much stronger, the colour is paler, more testaceous and the pallid apical elytral mark and the black marginal streak of *C. insolitus* are absent in this species.

Copelatus validus Sharp. group 1.

C. validus Sharp, 1882, *loc. cit.*: 584.

This species was described as a member of group XI on a unique female specimen, as indeed the presence of a submarginal stria would indicate. A single male in the British Museum collection from Rio Coto, Golfo Dulce, Costa Rica (coll. Pittier), bears a label "Copelatus limbicicollis Rég. n. sp. type," in Régimbart's handwriting. The name appears to be unpublished. This specimen has so strong a resemblance to the female of *C. validus* in form, colour and sculpture that I have no doubt they are the two sexes of one species. I append herewith a diagnosis of the male :—

7½ mm. long : 3⅞ mm. lat.

Oblongo-ovalis, sat latus, depressus, nitidus, niger, antennis pedibusque rufis, illis posticis infuscatis, prothorace ad latera elytrisque ad apices dilutioribus ; elytris sine striis, sed seriebus tribus punctorum distinctis, striis submarginalibus destitutis.

The colour is quite as in the unique female. The first three segments of the anterior and intermediate tarsi are strongly dilated and almost transverse, the claws strong and well curved.

The species appears to be closely related to *C. inornatus* Sharp (*loc. cit.* : 569), known only by a single male. The two species are very similar in colour, but *C. validus* is larger and broader.

C. validus appears to be the first species of group I, having the sexual dimorphism carried to the extreme of the female possessing a submarginal stria in addition to the other striae. The position of the submarginal stria is not quite normal, it being rather more medially placed than is usual in those species which normally possess a submarginal stria. It may be assumed that the female of *C. inornatus* will prove to be striate.

Copelatus tucuchiensis sp. n. group 1.

5½–6 mm. long : 2–3 mm. lat.

Ovalis, angustulus, subdepressus, minus parallellus, nitidus, niger ; capite prothoraceque ad latera late rufescentibus, illo medio nigro ; elytris nigro-piceis, fascia basali maculaque ante-apicali flavo-testaceis ; supra laevigatus, subtus rufescens. Elytris maris estriatis, feminae quinque-striatis.

Head reddish, towards the apex of the clypeus reddish-yellow, almost black around the eyes. Thorax black, the lateral margins widely rufescent, posterior angles smoky. Elytra dark piceous, shining, a basal band, not touching the shoulder or the suture, flavo-testaceous, and a subapical mark flavous. The external margins of the elytra paler, piceo-testaceous, the suture black from base to apex.

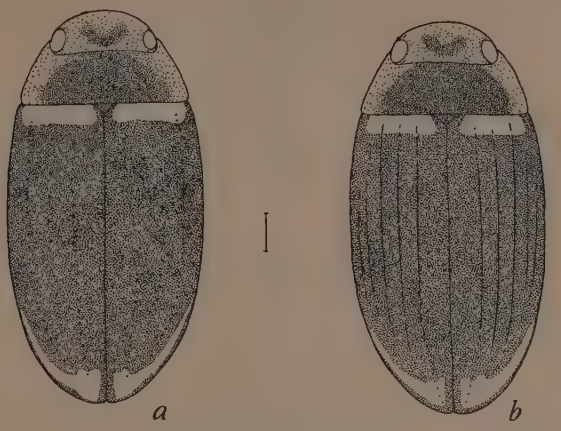

FIG. 4.—*Copelatus tucuchiensis* sp. n. (a) ♂; (b) ♀.

In the male the serial punctures of the elytra are distinct, quite unelongated, not forming striae. In the female the serial punctures are elongated to form the two main striae, the first and third: between them lies the second stria, less punctiform and more strongly impressed; external to the third lie the fourth and fifth as short punctiform striae extending only over the discal third of the elytra. There is no sexual sculpture in the female.

Antennae, legs and underside clear rufo-testaceous; metacoxae and epipleura infuscate.

♂ holotype, ♀ allotype, 1 ♂, 2 ♀♀ paratypes. TRINIDAD, B.W.I.: Mount Tucuchi, 2000 to 3000 ft., *S. A. Neave* (British Museum, 1924–164).

This species somewhat resembles *C. biformis* Sharp (1882, *Biol. Centr. Amer.*, Col. **1** (2) : 34) in form and sculpture, but the coloration is quite distinctive.

Copelatus brunneus sp. n. group 1.

4½ mm. long : 2¼–2⅓ mm. lat.

♀. *Oblongo-ovalis, minus parallellus et depressus, haud elongatus, testaceus, antennis pedibusque rufo-testaceis; elytris feminae striis brevibus subtilibus circa quattuor, plus minusve interruptis; supra laevigatus. Mas ignotus.*

Head and disc of the thorax rufo-testaceous, elytra clear translucent testaceous, obscurely paler at the base and apex. The whole upper surface is strongly shining, with a fine sparse punctation. The serial rows of punctures indicated on the disc of the elytra by somewhat interrupted striae; between the first and second, and the second and third rows of serial punctures is an accessory stria, also only evident on the disc. In one paratype

specimen the striae are much less developed, being represented by one or two elongate punctures rather than by striae. Beneath testaceous, quite shining.

♀ holotype, 2 ♀♀ paratypes. Colombia: Gorgona Island, 300 ft., Oct.–Nov. 1924, St. George Expedition, *C. L. Collenette* (British Museum, 1925–488).

This species is apparently very closely related to *C. laccophilinus* Sharp (1882, *Biol. Centr. Amer. Col.* **1** (2) : 35) of central America. It is smaller and more oval, without the blackish infuscation of the pronotum and elytra of the latter species, so that the colour is almost uniform. The presence of the rudimentary elytral striae is apparently distinctive, since in the twenty-seven individuals of *C. laccophilinus* from the Biologia Centrali Americana collection not one has the rudiment of a stria developed. I ascribe to this species, with very great hesitation, an immature female from Sapucay, Paraguay (*G. Morewood*, British Museum, 1919–76), which is slightly larger, but has the strial development of this species, and in other characters does not appear to be a specimen of *C. laccophilinus*.

Copelatus strigosulus (Fairm.). group 2.

Hydroporus strigosulus Fairmaire, 1878, *Pet. nouv. Ent.* **2**: 278.

5 mm. long : 2–2½ mm. lat.

Oblongo-ovalis, sat latus, minus depressus; capite prothoraceque ad latera late rufescentibus, illo medio fusco; mas supra laevigatus, elytris nigro-castaneis, striis quinque distinctis, plus minusve interruptis; tibiis anticis ad basin intus fortiter emarginatis; femina, prothorace elytrisque strigis numerosis longitudinalibus impressis, striis haud cernendis coram strigis. Antennae, pedes, subtusque rufescentes.

♂. Shining; head rufescent; pronotum blackish, the margins widely reddish; on the outer margin near the posterior angles of the pronotum four or five short deep strioles. Elytra obscurely dark castaneous, paler at the base and apex, darker at the suture and along the striae; external margins and epipleura black. Elytra with five striae, the second and fourth strong, reaching from the base almost to the apex, along the main serial rows of punctures; the first stria, between the suture and the second stria, finer and much interrupted, extending over the posterior two-thirds of the elytra; the third stria between the two main striae (2nd and 4th) on the serial rows of punctures better defined than the first, more entire posteriorly, degenerating anteriorly into linear strioles, beginning some distance behind the base. The fifth stria is visible only in the humeral region as a few linear strioles.

♀. Head rufescent, shining; pronotum blackish fuscous, the external margins widely reddish. Elytra dark piceous, the apex obscurely testaceous. The entire pronotum and elytra, with the exception of the extreme apex of the latter, densely covered with a sexual sculpture of strongly impressed fine longitudinal strioles which almost entirely obliterate the striae. Between the sexual sculpture the surface is quite dull from a strongly impressed reticulation of small round areoles.

Both sexes dark fuscous beneath, the apices of the abdominal sterna paler, the apical sternum in the male emarginate-truncate.

Fiji Islands: Tamavui (*H. W. Simmonds*) (British Museum, 1936–90).

Recently, in preparing material for a paper on the aquatic Coleoptera of Oceania, I realised that the ♀ from Tamavui, which had been submitted to Zimmermann and returned by him as "*Copelatus* sp. nov." agreed very well with Fairmaire's description of *H. strigosulus*, included by Zimmermann in *Copelatus* but marked (gen. dub.). Because of the sexual dimorphism I have given a complete description of both sexes.

An isolated species, the only others of this group known from the Sino-Austral-Malay region being *C. parallellus* Zimm., and *C. vagestriatus* Zimm. The strong sexual dimorphism is similar to that seen in *C. papuensis* sp. n. of group XIII (see below). The female is somewhat similar in appearance to *C. sharpi* Van den Brand. (1885, *Ann. Soc. ent. Belg.* **29** : 86) from Mexico, a species of group XII, the male of which, I suspect, is *C. laeticulus* Sharp. If that suspicion can be confirmed it will provide a further example of extreme sexual dimorphism in the genus.

Copelatus sp. n. (?). group 2.

5 mm. long : 2½ mm. lat.

♀ *immatura. Oblongus, angustus, elongatus, parallellus, subdepressus, fuscus ; capite prothoraceque lateribus fusco-rufis, elytris flavo-piceis, basi apiceque dilutioribus ; striis quinque, prima a suturo remota ; omnino subtiliter tenuissime punctulatus ; prothorace ad latera late brevissime striguloso.*

This species may perhaps be identical with *C. restrictus* Sharp (*loc. cit.* : 571), described from a unique male specimen from Monte Video. The present specimen is evidently immature, but it would appear to be distinct by the presence of elytral striae, and the unstriolate elytra. In view of its immaturity, I think it is better to leave the species unnamed, with the above short diagnosis.

♀. Brazil : Rio de Janeiro (Mus. Turner) Sharp coll. (British Museum, 1905–313).

Copelatus sahlbergi nom. n. group 2.

C. punctulatus Sharp, 1882, *loc. cit.* : 571, pl. 15, fig. 185. *nec* Aubé.

Aubé's species (1838, *Spec. Col.* **6** : 361) which is now a synonym of *C. glyphicus* Say preoccupies the name *punctulatus* and I propose the name *sahlbergi* for Sharp's species.

Copelatus fryi (Sharp *in litt.*) sp. n. group 2 (?).

6–6¼ mm. long : 2⅔–3⅓ mm. lat.

Oblongo-ovalis, subdepressus, nigricans, nigro-piceus ; capite antice prothoraceque ad angulos anteriores vage piceis, illo maris in medio marginorum anteriorum posteriorumque vage striolato-corrugato ; elytris nigris, apicibus piceis ; prothorace maris tenuissime, sat distincte punctulato, elytris pertenuissime, sat remote punctulatis ; femina vertice capitis, prothorace elytrisque, illis apicibus exceptis, dense longitudinaliter striolatis ; elytrorum striae variabiles, circa quinque, striis submarginalibus destitutis. Mas, tibiis anticis ad basin intus leviter emarginatis : segmentibus tribus basalibus tarsorum anteriorum intermediorumque dilatatis, fere transversis : segmentibus ultimis tarsorum intermediorum longis.

An undoubtedly new species of rather uncertain affinities. There is a very strong sexual dimorphism, the female being densely covered with a strong sexual sculpture of longitudinal strioles ; in this sex the striae are almost effaced by the sculpture, only the apices being clearly visible, and in the two specimens, five striae can be discerned. In the male, two of the four specimens have only two striae : these are strong and deeply impressed along the lines of serial punctures, somewhat broken at base and apex ; between these two striae lies a line of widely spaced strong linear punctures, and between the outer stria and the margin is a line of more numerous, weaker punctures. In the two remaining males the two main striae are more complete, the serial punctures between them developed into a strong stria, complete on the disc, but more or less broken in front and

behind; the external series of punctures in one specimen remain: in the second they have become a much interrupted stria. In these two specimens a weakly impressed linear series of punctures is developed between the suture and the first stria; there are also one or two elongate punctures in linear order between the deeply impressed striae.

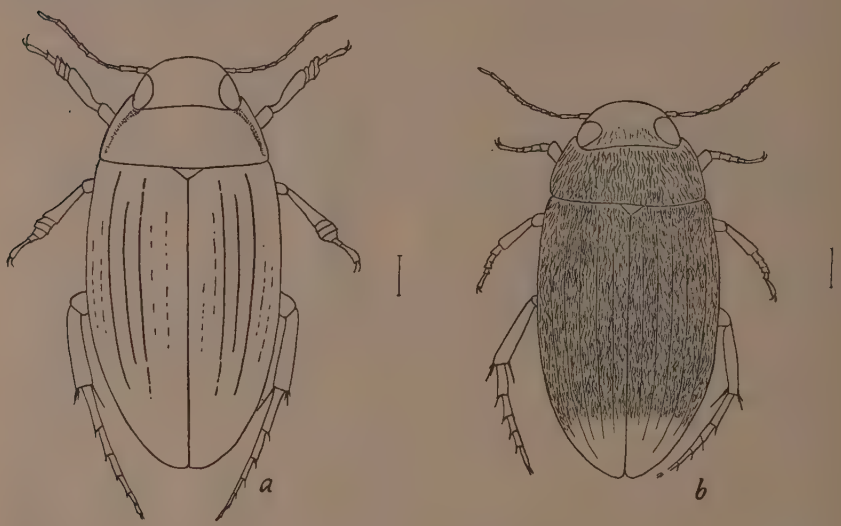

Fig. 5.—*C. fryi* sp. n. (a) ♂; (b) ♀.

The species is of the general form of *C. inornatus* Sharp of group I, and is also similarly coloured. On the presence of two, three, or five striae it must be placed in group II, but it is extremely unlike any of the other neotropical species in that group, being much less elongate and parallel-sided. The correct affinities of the species must remain in doubt.

♂ holotype, ♀ allotype, 3 ♂♂ paratypes, Peru, Fry coll. (British Museum, 1905–100). ♀ paratype, Ecuador, Fry coll. (British Museum, 1905–100).

Copelatus fidschiensis Zimmermann. group 3.

C. fidschiensis Zimm., 1928, *Wien. ent. Ztg* **44** : 173.

This species was placed in group III by Zimmermann with a remark that two individuals examined by him had the rudiment of a submarginal stria, which would place them in group X. Four other specimens, two of each sex, have been examined: in one ♂ and one ♀ the submarginal stria is long and quite clearly impressed; in one ♀ it is absent and in the remaining ♂ it is represented by an elongated puncture. It is clear that in respect of the submarginal stria this species must be placed along with *C. aethiopicus* Rég. (1906, *Ann. Soc. ent. Fr.* **1906** : 250) and *C. ragazzii* Rég. (1887, *Ann. Mus. Genova* (2) **4** : 637) as being variable. The relationship of *C. fidschiensis* would seem to be with these two African species which it closely resembles in form and size. I have left the

species in group III, where it was placed by Zimmermann, but it might equally properly be placed in group X.

Copelatus wallacei sp. n. group 3.

6½ mm. long: 3 mm. lat.

♀. *Oblongo-ovalis, sat angustus, subdepressus, niger; capite prothoraceque late ad latera rufis, illo latiore ad latera strigulato: elytris fascia basali anguste rufescente, striis sex integris sat profundis, strigulis sexualibus tenuis plus minusve late, distinctis: superne pertenuissime vix visibiliter punctulato; subtus niger, antennis pedibusque rufis. Mas ignotus.*

Head shining, red; pronotum black, lateral margins broadly reddish. With the exception of the disc the whole pronotum is covered with a fairly dense striolation of short, deeply impressed but fine strioles. Elytra shining black; a narrow basal fascia, most clearly visible between the second and sixth striae, reddish. There is a sexual sculpture of short fine longitudinal strioles widely scattered over the basal half of the elytra. The six striae are deeply impressed; the first to the fifth extending from the base almost to the apex, the sixth joining the fifth at about two-thirds of the length of the latter. Epipleura black, underside, with the exception of the fusco-testaceous prosternal process, black. Antennae and legs reddish.

♀ holotype and ♀ paratype, Batchian Island, Wallace coll. (British Museum, 67–56; 62–30).

This species is undoubtedly close to *C. xanthocephalus* Rég. (1899, *Ann. Soc. ent. Fr.* **1899**: 293) but it is smaller, less parallel-sided and has a distinct narrow basal fascia on the elytra. The black epipleura, black under-surface, and distinct pronotal striolation are also distinctive. The junction of the fifth and sixth striae occurs similarly in both species. These two species are not distantly related to the *C. gentilis* Sharp-group of group X.

Copelatus annobomensis sp. n. group 3 (?).

4¾–5 mm. long: 2¼ mm. lat.

Elongato-ovalis, angustulus, subparallellus, nigricans, piceus; capite prothoraceque sordide piceis, illo ad latera vage rufo, elytris piceis vel rufo-piceis, ad latera nigricantibus: numera mutabiliter striorum elytrorum, vel sex vel decem, striis submarginalibus destitutis; elytris feminae crebre longitudinaliter striolatis, postice laevigatis, striis sex tenuis. Tibiae anteriores maris leviter intus emarginatae, segmentibus tribus basalibus tarsorum anteriorum intermediorumque dilatatis, fere transversis.

Head and pronotum dark piceous, the sides of the pronotum vaguely reddish. Elytra reddish piceous, the lateral margins infuscate. The striation is not well defined; there are six main striae, moderately well impressed in the male, very fine in the female and difficult to discern among the strioles of the sexual sculpture. There are, in one male specimen, four interstriae between the main striae, more lightly impressed and interrupted; in the second male specimen these interstriae are reduced to a few linear strioles. In the female the interstriae cannot be discerned because of the sexual sculpture. This species should perhaps be placed, more correctly, in group V next to *C. instabilis* Rég. (1897, *Bull. Soc. ent. Fr.* **1897**: 210) which I have not seen. The description of *C. instabilis* indicates a reduction of the first, second, fourth and sixth striae; in *C. annobomensis* the second, fourth, sixth and eighth are the reduced striae, the first being entire, but shorter than the other main striae in front. The frons appears slightly inflated.

♂ holotype, ♀ allotype, and ♂ paratype (damaged). West Africa: Gulf of Guinea, Anno Bom Island (English—Annobon), "800 ft., edge of lake." Discovery Expedition, 13.viii.1927 (British Museum, 1930–108).

This species seems related to *C. instabilis* Rég. from Mauritius, being, like it, of the form of *C. alternatus* Sharp (*loc. cit.* : 576) from Brazil (group V). It is unlike any other African species known to me.

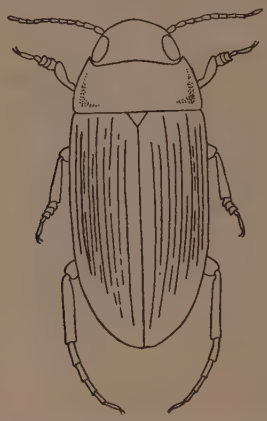

FIG. 6.—*Copelatus annobomensis* sp. n. ♂.

Copelatus nilgiricus (Rég. in litt.) sp. n. group 3.

3¾–4⅕ mm. long : 2–2⅓ mm. lat.

Ovalis, latiusculus, subdepressus, ferrugineus ; vertice capitis, prothorace, abdomineque nigricantibus ; elytris testaceo-ferrugineis, macula magna discoidali nigra, capite antice prothoraceque ad latera ferrugineis ; capite thoraceque subtiliter sed evidentius punctulatis ; thorace ad latera fortiter striguloso ; elytris striis sex integris sat profundis, suturali multo subtiliore ; striis submarginalibus destitutis. Femina, thorace elytrisque strigis subtilibus numerosis impressis.

Head ferruginous in front, the vertex infuscate. Pronotum infuscate, the margins more or less broadly ferruginous. Elytra testaceo-ferruginous or testaceous, a large discoidal mark, elongated posteriorly between the suture and the first stria to reach the apex, and a small humeral mark between the fourth and the sixth striae, black. Head and pronotum evidently but finely punctured, the elytra much more finely and obscurely punctured. The female paratype is much smaller and redder than the male type, and the black marks are much reduced. The elytra of the female have a dense sexual sculpture of short linear strioles which nearly obliterates the striae. There is also a sexual sculpture on the female pronotum, less dense at the margins and absent on the disc. Beneath blackish ferruginous. The male anterior tibiae are slightly emarginate on the inner side of the base.

♂ holotype. SOUTH INDIA : Nilgiri Hills (*H. L. Andrewes*) (British Museum, 1922–221). ♀ allotype, SOUTH INDIA : Malabar, Andrewes Bequest (British Museum, 1922–221). ♂ paratype " India " (British Museum, 67–56).

This species is remarkably similar in form, sculpture and colour to *C. discoideus* Sharp (*loc. cit.* : 582) (of the *C. pulchellus* Aubé sub-group of group X (see below, p. 80)), the female being extremely similar to that sex of *C. andamanicus* Rég. of the same complex. The smaller size, and the absence of the submarginal stria seem the only distinguishable characters, and both are of prob-

lematical specific value. Other species show similar approximations between groups III and X in the possession of weak specific characters. Between these two groups the dividing line of possession or lack of the submarginal stria seems much less conclusive than between any other two groups. I have retained the name which the species bore on labels in Régimbart's handwriting, but I have not been able to find that it has been published previously.

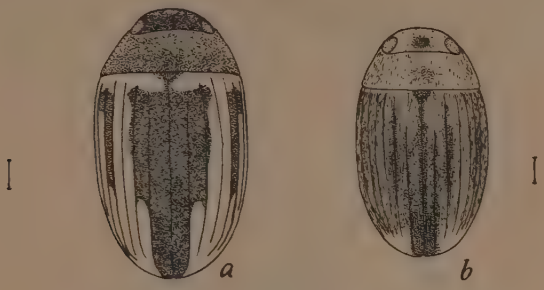

FIG. 7.—*Copelatus nilgiricus* sp. n. (a) ♂; (b) ♀.

Copelatus incognitus Sharp. group 5.

C. incognitus Sharp, 1882, *Biol. Centr.-Amer., Col.* **1** (2) : 38.
C. neglectus ♂ var. : Sharp, 1882, *loc. cit.* : 37. **syn. n.**

Two male specimens from Cordova, Mexico, Sallé collection, were ascribed by Sharp " with some doubt " to *C. neglectus*, the type of which species is an immature male. A careful examination and comparison show that the sculpture, the form of the tarsal segments and claws, and the tibial shape are different in these specimens from those of the type of *C. neglectus*. *C. incognitus* Sharp was described from three females from Cordova from Sallé's collection and the approximation between the two males under discussion and these three females is so close that, in conjunction with the identical locality, I am of the opinion that the males are those of *C. incognitus*.

Sharp placed *C. incognitus* in group X and described the submarginal as " aegre discernenda." This is certainly true, and it seems to me to be a matter of opinion whether it is properly to be regarded as a stria in the sense in which the word is used for groups VIII to XIV. To my mind it has the appearance of a short row of more or less elongate punctures. The sexual sculpture of the female is deep and dense and appears to submerge the " even " striae which, in the male, are shorter and finer than the " odd " striae. The males are without a trace of either true or false submarginal striae and as they have ten other striae the species is perhaps more correctly to be placed in group V. It is very closely related to *C. neglectus*.

Copelatus cheesmanae sp. n. group 7.

5–5½ mm. long : 2¼–2⅔ mm. lat.

Ovalis, angustulus, sat depressus, nitidulus, rufo-niger ; capite prothoraceque, hoc late ad latera, rufis, elytris lateribus vage rufescentibus, antennis pedibusque rufescentibus ; capite

inter oculos strigulis tenuis perpaucis brevissimis, prothorace strigulis brevibus tenuis sat distinctis; elytris striis duodecim distinctis, bene impressis, multis disintegratis. Subtus niger, processu prosternali metasternalique rufescentibus. Mas, segmentibus tribus basalibus tarsorum anteriorum intermediorumque haud dilatatis: tibiis anticis intus simplicibus.

Head and pronotum reddish, the latter with the disc widely infuscate. The head with a few very short strioles between the eyes, the pronotum with a more copious striolation around the margins, the disc nearly smooth. The elytra with twelve fine but well-impressed and much broken striae. In some specimens there is a quite clearly-defined punctiform submarginal, in others the punctures in the submarginal series are quite normal.

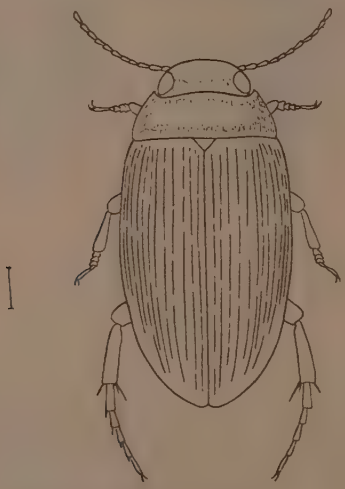

FIG. 8.—*Copelatus cheesmanae* sp. n. ♂.

The sexes are difficult to distinguish; the male anterior and intermediate tarsi have the basal segments scarcely dilated and the anterior tibiae are simple. The presence of the adhesive hairs on the underside of the basal segments of the male tarsi is the surest indication of the sex.

In the male the aedeagus is simple, gently curved from base to apex, the apex smoothly rounded and slightly bent out of the plane of the proximal portion.

♂ holotype, ♀ allotype, 2 ♂♂ paratypes, NEW HEBRIDES: N.E. Malekula, vi.1929 (British Museum, 1929–410). 4 ♀♀ paratypes, NEW HEBRIDES, Malua Bay, Malekula, vi.1929 (British Museum, 1929–410). 2 ♂♂, 2 ♀♀ paratypes, Malekula, i.1930 (British Museum, 1930–178). 1 ♂, 1 ♀ paratypes, BANKS ISLANDS, Vanua Lava, x.1929 (British Museum, 1930–477) (*Miss Cheesman*).

This species is very similar to *C. aubei* Montr. (1860, *Ann. Soc. ent. Fr.* (3) **8**: 244) from New Caledonia of group XIV, being about the same size and colour, but clearly distinct by the lesser degree of impression of the strioles on the head and pronotum and the less impressed elytral striae. The striae of *C. cheesmanae* are much more broken and discontinuous throughout their length, and the submarginal stria when present is much more punctiform. The species is also closely related to *C. interruptus* Perr. (1864, *Ann. Soc. linn. Lyon* **11**: 79),

which is larger and differs in colour, but in a similar manner has the striae more broken than in *C. aubei*. The aedeagus of *C. interruptus* is very distinct, being much more robust, the apex bluntly pointed, the stem broadest in the middle and tapering to base and apex; the parameres are also broader than in *C. cheesmanae* (see fig. 9 (a) and (b) for aedeagus).

Fig. 9.—Aedeagus (lateral view) of (a) *C. interruptus* Perr.; (b) *C. cheesmanae* sp. n.; (c) *C. striolatus* sp. n. (The internal line in each represents the dorsal lobe.)

C. cheesmanae might perhaps be placed in group XIV on the occasional presence of a punctiform submarginal stria, but the majority of the specimens I have seen lack it, so I have placed it in group VII.

Copelatus striolatus sp. n. group 7.

3¾–4 mm. long: 2 mm. lat.

Elliptico-ovalis, sat angustus, subdepressus, nigricans, elytris piceis; capite antice, prothorace ad latera, elytrorumque basi dilutioribus; antennis pedibusque sordide ferrugineis; capite crebre subtiliter punctulato; angulis posticis prothoracis striolatis; elytris striis undecim vel duodecim nigris, conspicuis sed maxime disintegratis. Subtus nigricans. Mas, tibiis anticis intus simplicibus, segmentibus tribus basalibus tarsorum anteriorum intermediorumque vix dilatatis.

Head black, labrum and the edge of the clypeus and two connected spots on the vertex brownish-yellow. Thorax black, the anterior angles and lateral margins brownish-yellow; the posterior angles with a few punctiform strioles. Elytra brownish-yellow, the much broken striae black. The entire upper surface dull owing to the finely impressed reticulation of small round areoles. A very fine punctation may be discerned on the head and also on the pronotum, where it is more widely scattered.

Beneath infuscate-testaceous, the edges of the sterna obscurely paler. The sexes are hard to distinguish, the male anterior and intermediate tarsi having the basal segments scarcely dilated. The reticulation of the female is a little more strongly impressed than that of the male, rendering the insect somewhat duller. The adhesive hairs on the underside of the basal segments of the male tarsi are quite evident. The aedeagus is very similar to

Fig. 10.—*Copelatus striolatus* sp. n. ♂.

that of *C. cheesmanae*, but is finer and less evenly curved throughout its length, being, at about one-third of its length from the base, sharply angled on the dorsal side with the apical two-thirds almost straight (fig. 9 (c)).

♂ holotype, ♀ allotype, and 2 ♂♂ paratypes, New Caledonia: Pampai, 15.ix.1914 (*P. D. Montague*) (British Museum, 1918–87).

This species is very isolated, the striae being so much broken, with wide spaces between the breaks, that they appear more as linear series of very elongated punctures than as striae. There is no trace of a submarginal stria.

Copelatus apicalis sp. n. group 10.

6½ mm. long: 3 mm. lat.

Ovalis, vix latus, subparallellus, subdepressus, nitidus, piceus, supra nigricans, capite rufo, maculâ vagâ in vertice nigrâ; prothorace nigro, ad latera plus minusve late rufescente, angulos posteriores prothoracis feminae areâ parvâ strigulosâ, elytris nigris, basi apiceque rufo-flavis ornatis, striis sex integris, subtilibus sat distinctis, striisque submarginalibus ante medium abbreviatis; antennis pedibusque rufis, illis posticis sordidis. Tibiae anteriores maris ad basin intus fortiter et acute angulatae et emarginatae.

Head shining, reddish, a broad inverted V-shaped mark between the eyes, black. Thorax black, the anterior angles reddish, the posterior angles of the male with close fine punctures, in the female with a few short strioles. Elytra black, a basal band reaching

from the humeral area to the first stria and an apical triangular mark reddish-yellow. The elytra with six fine, distinct striae and a short submarginal stria. The first and fifth striae begin some distance behind the base, the others begin at the base. Beneath, infuscate-reddish; antennae and legs reddish, the posterior legs infuscate. Anterior tibiae of the male strongly and sharply angulated and emarginate at the base internally. The apical tarsal segments of the anterior and intermediate tarsi long in both sexes, as long as the second, third and fourth segments together.

♂ holotype, SOLOMON ISLANDS: Tulagi (*Lever*) ("on leaf") (British Museum, 1936–90). ♀ allotype, PAPUA: Kokoda, 1200 ft., v.1933 (*Cheesman*) (British Museum, 1933–577).

This species seems to be most nearly related to *C. geniculatus* Sharp (*loc. cit.*: 581), and *C. lineatus* Guér. (1830, *Voy. Coquille, Insectes*, pl. 1, fig. 19; 1836, **2**: 62). It is distinguishable from the male type of the former by the colour and by the absence of the strioles from the male pronotum. It is considerably larger and darker than *C. lineatus*. It also resembles *C. gentilis* Sharp but is considerably larger than that species and is more parallel-sided.

Copelatus gentilis Sharp. group 10.

C. gentilis Sharp, 1882 (*loc. cit.*: 581).

A good series of this species has been identified from Malekula Island, New Hebrides. The males are as strongly striolated on the posterior pronotal angles as the females. The first three segments of the anterior and intermediate tarsi of the male are strongly dilated and almost transverse, each segment provided with four suckers beneath.

A single male from AUSTRALIA: North Queensland, Moosman (*J. C. Kershaw*) is also in the British Museum collection.

Copelatus gentilis Sharp **ab. divisus** ab. n.

Forma et statura typica, capite prothoraceque minus rufescentibus, elytris rufescentibus, minus nitidus, ad basin vix dilutioribus.

This aberration, represented by two males, is quite distinct in colour from the typical form. The head and pronotum are scarcely marked with reddish colour, the elytra entirely reddish, the pale basal vitta scarcely distinguishable.

♂ holotype and paratype, NEW HEBRIDES: Malekula Island, i.1930 (*Cheesman*) (British Museum, 1930–178).

Copelatus oblitus Sharp. group 10.

C. oblitus Sharp, 1882 (*loc. cit.*: 582).

This species has only been known from a single male, the type of Sharp. A female collected by Wallace from Macassar, Celebes, has been identified as this species. It agrees completely with the male in form, size, and sculpture, but has the basal segments of the anterior and intermediate tarsi simple, undilated, as is normal in this sex. The anterior tibiae of the male are simple, unemarginate at the base internally.

Copelatus minutissimus sp. n. group 10.

4 mm. long: 1⅝ mm. lat.

Elongatus, angustus, parallellus, rufo-testaceus; prothorace versus angulos posteriores areâ parvâ strigulosâ; vittâ flavâ angustâ ad basin elytrorum et humeros et sutura attingente;

elytris striis sex subtilibus, striâ primâ, quintâ, sextâque anterius desinentibus, striis submarginalibus longis. Antennis pedibusque rufo-testaceis, his longis, prope 2 mm. attingentibus; tibiis anticis maris intus ad basin fortiter emarginatis, tarsorum anteriorum intermediorumque segmentibus tribus basalibus dilatatis, segmentibus ultimis longis.

Head and pronotum reddish testaceous, the former anteriorly, the latter antero-laterally reddish-yellow, with the base darker. Elytra rufo-testaceous with a narrow transverse basal band, reaching both shoulder and suture, yellowish. There are six finely but evidently impressed striae and a submarginal. The first, fifth and sixth striae begin somewhat behind the base, the submarginal reaches from just in front of the middle of each elytron almost to the apex.

The antennae are noticeably long, reaching to the middle of the body; they and the legs are reddish testaceous. The three basal segments of the anterior and intermediate

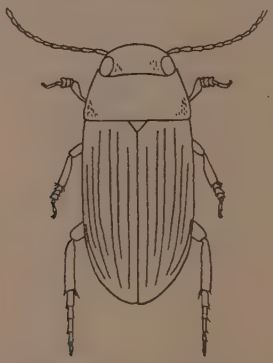

FIG. 11.—*Copelatus minutissimus* sp. n. ♂.

tarsi of the male are moderately dilated, the penultimate segment short, the fifth long, about as long as the first four segments together. Body beneath, reddish-yellow.

♂ holotype and paratype, SINGAPORE (*C. J. Saunders*) (British Museum, 1929–369). ♀ allotype and ♂ paratype, SOUTH EAST BORNEO, German Mission, Fry coll. (British Museum, 1905–112). ♂ paratype, ASSAM: Patkai Mountains (*Doherty*) Fry coll. (British Museum, 1905–112).

A small narrow species belonging to the *C. tenebrosus* Rég. group and apparently related to *C. feae* Rég. but much smaller, narrower, longer and more parallel-sided. The female closely resembles the male but can be distinguished by the simple anterior tibiae and undilated tarsi.

Copelatus pulchellus (Klug) Aubé. group 10.

A careful examination of the material in the British Museum collection has led me to the conclusion that this is a remarkably variable species in size, form and colouring. The range of distribution is very wide, and I am of the opinion that there is but one species, *C. pulchellus* Aubé (*ex parte* Klug). *C. strigulosus* Sharp is merely a form of the female in which the sexual sculpture reaches a high degree of development; *C. africanus* Sharp is only a colour form of the species and appears to be spread almost throughout Africa. *C. obtusus* Boh., *C. discoideus* Sharp, *C. indicus* Sharp, and *C. andamanicus* Rég., seem to be

deserving of subspecific status. *C. subfasciatus* Zimm. is also possibly in this complex, but of this species I have seen only one doubtfully determined female.

The specimens I have seen from Mauritius, the type locality, are very constant in size and form, and agree well with Aubé's description, as also do specimens from Senegal. No female specimen I have seen from Mauritius has sexual sculpture. The specimens from Rodriguez are much brighter in colour with a clear straw-yellow basal band on the buff elytra, with a somewhat darker, ill-defined, discoidal mark. They are uniform in size and form with typical individuals, but the females show a sparse sexual sculpture of lightly-impressed short longitudinal strioles towards the sides of the elytra. Specimens from Aldabra are smaller than any others I have seen, being only $4\frac{3}{4}$–5 mm. long; the males are quite typical; the females have the elytra covered with a dense sexual sculpture in the manner of the ♀ form ab. *strigulosus* Sharp.

From Portuguese East Africa there are two forms; one typical in colour, but narrower in proportion to the length than the typical form; the second is the ab. *africanus* Sharp form.

Specimens from Bechuanaland and Natal show a variation in colour towards the subspecies *obtusus* Boh., having black or blackish marks on the elytra with the basal and lateral areas a dark yellowish colour, but their form is that of typical *C. pulchellus*.

Specimens from north-east Rhodesia show much variation. Two males agree very well with the description given by Gschwendtner of a single male from Elizabethville, Belgian Congo, and appear to be a variation of the ab. *africanus* Sharp. A further specimen from the same locality is the normal ab. *africanus* Sharp; a fourth specimen is of the subspecies *discoideus* Sharp; others are of the subspecies *obtusus* Boh. Specimens from north-west Rhodesia are the ab. *africanus* Sharp and typical subspecies *obtusus* Boh.

Of the subspecies *obtusus* Boh. there are two forms. Some are of the typically coloured form with black discoidal and humeral marks, and the general ground colour of the elytra yellow, while others are coloured as in the ab. *africanus* Sharp, but the two forms intergrade completely.

The subspecies *discoideus* Sharp is represented by specimens from Mesopotamia (types); India (Berhampur); Tanganyika; Senegal; North Nigeria (Kano Province); and north-east Rhodesia. The subspecies seems fairly constant in size, form and colour.

The subspecies *indicus* Sharp I have seen only from India and Assam. It is very uniform in size and form, but there are variations in the colour towards subsp. *discoideus* Sharp.

In all these forms there is every variation of the sutural stria from entire to a short subapical scratch.

Of *C. andamanicus* Rég., I have seen only three specimens. The size is small, about $5\frac{1}{3}$ mm. long, and the colour of the elytra is terra-cotta red, but I can see nothing in the structure to justify the retention of the form as a distinct species. All three specimens are females and are destitute of a sexual sculpture.

The *C. pulchellus* sub-group of group X thus becomes :—

pulchellus (Klug) Aubé (♀ *strigulosus* Sharp).
ab. *africanus* Sharp.
s.sp. *obtusus* Boh.
s.sp. *indicus* Sharp.
s.sp. *discoideus* Sharp.
s.sp. *andamanicus* Rég.
(?) s.sp. *subfasciatus* Zimm.

Copelatus caffer sp. n. group 10.

6¼ mm. long : 3 mm. lat.

♀. *Ovalis, vix angustus, subdepressus, nitidus, aut niger aut nigro-piceus, capite anterius, prothorace late ad latera vage rufis ; elytris nigro-piceis, fasciâ transversâ basali, postice undulatâ, vittâ intra-laterali cum fasciâ antice, et maculâ ante-apicali fere conjunctâ, flavo-testaceis ; striis sex integris sat subtilibus, prima ante medium desinente, striis submarginalibus valde abbreviatis ; prothorace strigulis brevibus subtilibus sparsis. Supra laevigatus, subtus rufo-piceus. Mas ignotus.*

Head and pronotum reddish-black, the former anteriorly, the latter at the margins paler. Elytra black, or reddish-piceous; a basal band, not touching the suture nor the shoulder,

Fig. 12.—*Copelatus caffer* sp. n. ♀.

a subapical spot, and a longitudinal band between the outer end of the transverse basal band and the subapical spot, yellow or yellowish-red. The pronotum has a few widely scattered short strioles along the lateral margins. There are six striae, the first only reaching from behind the middle to the apex, the second and fourth long, entire, the third and fifth beginning behind the base, the sixth long; there is also a short submarginal.

♀ holotype, Zululand (British Museum, 65–14). ♀ paratype (immature) South Africa : Pondoland, Port St. John (*R. E. Turner*) (British Museum, 1924–177).

This species has a very great similarity to *C. formosus* Wollaston (1867, *Coleopt. Hesperid.* : 34), and I am by no means certain that it is not a form of that species in which the " even " striae (of group XII) have entirely disappeared, a feature which appears to be incipient in *C. marginalis* Gschw. (1932, *Rev. Zool. Afr.* **22** : 57), which I consider is only a form of *C. formosus* in which there is a reduction of the first, second and sometimes the third striae. This reduction of striae is a fairly general phenomenon in the genus, but I have not seen the process carried as far as in this case, and I have left these specimens as representatives of a new species of very doubtful validity.

Copelatus nigrostriatus Rég. group 12.

C. nigrostriatus Rég. (1895, *Mém. Soc. ent. Belg.* **4** : 170).

A single female from Angola in the British Museum collection determined by Régimbart as this species is 6 mm. long, which is considerably larger than the size given in the description. There is a second female, from north Nigeria, which is quite similar to the specimen determined by Régimbart, but which attains 6½ mm.

Copelatus atrosulcatus Rég. group 12.

C. atrosulcatus Rég., 1906 (*Ann. Soc. ent. Fr.* **75** : 251).

Régimbart originally described this species as a variety of *C. owas* Rég. from Madagascar, but, with the separation of it as a distinct species, the continental African records for *C. owas* were wiped out. A single specimen was received by the British Museum from Régimbart in 1905 from Nairobi, British East Africa. Possibly this is one of the series obtained by Alluaud from which Régimbart made the description; in the loosest sense, therefore, it would be a typical example of the species *C. atrosulcatus*; it is, however, labelled "hova var."

I have seen specimens from Uganda: Kampala and Ruwenzori, which are smaller and darker, but otherwise quite similar to the Kenya specimen. I also have a specimen from West Darfur, Anglo-Egyptian Sudan, which is similar to the Uganda examples. In Sharp's collection are two individuals from Yemen, Arabia, bearing a MS. label, "Copelatus principalis n. sp." in Sharp's handwriting. They are quite similar to the Kenya specimen, and the name is unnecessary.

Copelatus erichsoni Guér. group. group 12.

The material in the general collection of the British Museum includes the doubtful species *C. polystrigus* Sharp which is represented by the type, a ♀. The only other specimen is a ♀ and bears a label "*polystrigus* var. Sharp" in Sharp's handwriting.

An examination of the material of *C. erichsoni* Guér. shows all the specimens to be very similar with no trend towards the form of *C. polystrigus*. Exhaustive examination has failed to add any fresh characters in support of the specificity of *C. polystrigus*, but I am not in agreement with its position as a variety of *C. erichsoni*. Although the size of the type is quite comparable with Abyssinian specimens of *C. erichsoni*, there is a definite impression of greater breadth, and the remark of Régimbart that his series from the Arussi Galla proves the varietal standing of *C. polystrigus* is not convincing. He says that *C. polystrigus* is "plus attenué en arrière, plus étroit" than *C. erichsoni* and this is definitely not correct. *C. polystrigus* is much more evenly rounded and less attenuated behind than any specimens of *C. erichsoni* I have seen, so that the form is more oval, whilst *C. erichsoni* appears elliptical.

The differences appear quite definite to me, but in the absence of a sufficient series of *C. polystrigus* I do not feel justified in altering the present arrangement, but place my disagreement on record.

Sharp and Régimbart both regarded *C. formosus* Woll. as conspecific with *C. polystrigus*, whilst Zimmermann (1920) separated the species but gave no grounds for so doing. A comparison of Wollaston's and Sharp's types convinces me that they are distinct species. In *C. formosus* the form is narrower and more depressed and the striae are more finely impressed. *C. marginalis*

Gschw., of which I have seen a paratype, is only a form of *C. formosus* in which there is a failure of the first stria and sometimes of the second stria in the anterior part. I am by no means certain that the form is deserving of named varietal rank since in this genus the failure of one or more striae, particularly anteriorly, is of common occurrence and I have seen specimens of *C. marginalis* in which the first and second striae have disappeared with the exception of the extreme apical portion of the latter.

C. andreinii Rég. appears to be very closely related to *C. formosus* and may be only a dark form of that species.

Specimens from Port Saint John, Pondoland, are typically *C. erichsoni* in form, but have the pale elytral bands absent, so that the specimens are quite black. These I designate a new aberration :—

Copelatus erichsoni Guér. **ab. johannis** ab. n.

Forma et statura typica sed aberratio coloris. Nitidus, nigerrimus, capite antice prothoraceque ad latera tenuiter rufis.

♂ holotype, ♀ allotype, 3 ♂♂ paratypes, South Africa: Pondoland, Port St. John (*Turner*) (British Museum, 1924–54, 1924–109, 1924–6, 1924–177).

Copelatus propinquus Régimbart. group 12.

C. propinquus Rég., 1895, *Mém. Soc. ent. Belg.* **4** : 174.

Two specimens from Uganda agree perfectly with a type from Régimbart's collection. The species has not before been recorded elsewhere than west Africa.

Copelatus speciosus Rég. group 12.

C. formosus Rég., 1888, *Ann. Soc. ent. Fr.* (6) **8** : 392.
C. speciosus Rég., 1891, *Ann. Mus. Genova* (2) **10** : 991.
C. tarapotensis Zimm., 1920, *Coleopt. Cat.* **71** : 143. **syn. n.**

Zimmermann appears to have overlooked the fact that Régimbart had already recognised the name *C. formosus* to be preoccupied and had proposed the name *C. speciosus* instead. The name *C. tarapotensis* is therefore unnecessary and falls as a synonym.

Copelatus americanus nom. n. group 12.

C. lividus Zimm., 1924, *Ark. Zool.* **16** (4) : 2. (*nec* Sharp) **syn. n.**

Sharp's group I species preoccupies the name *C. lividus*; a fact that Zimmermann appears to have overlooked. I therefore propose the new name *C. americanus* for *C. lividus* Zimm.

Copelatus andrewesi sp. n. group 12.

4½–4¾ mm. long : 2⅓–2¼ mm. lat.

Elliptico-ovalis, angustulus, subdepressus, nigricans, testaceus, capite prothoraceque rufo-flavis, illo medio vage fusco, pertenuissime obsolete punctulato ; elytris rufo-testaceis, basi dilutiore, maris striis decem integris subtilibus, paribus brevioribus et antice paulo abbreviatis, striis submarginalibus longis ; feminae striis vel decem vel duodecim integris, bene impressis, decimá duodecimáque multo brevioribus, hac brevissimá, striis submarginalibus longis ; subtus nigricans, coxis anticis intermediisque cumque processu prosternale flavo-testaceis. Mas,

tibiis anticis intus ad basin emarginatis, segmentibus tribus basalibus tarsorum anteriorum intermediorumque dilatatis, fere transversis.

This species is very similar to *C. glyphicus* Say, but is distinguished by the finer, less impressed elytral striae, the more strongly emarginate anterior tibiae and the more dilated basal segments of the anterior and intermediate tarsi of the male, the development of the accessory "tenth" and "twelfth" striae in the female, the long submarginal stria, which reaches well in front of the middle of the elytra, and the slightly smaller size. The male type is immature and of an immaculate flavous colour.

♂ holotype, ♀ allotype, 1 ♀ paratype, B.W.I.: Trinidad, Andrewes Bequest (British Museum, 1922–221).

This species is also closely similar to *C. coelatipennis* Aubé, from which, however, it is easily distinguished by the complete absence of strioles on the pronotum in both sexes.

Copelatus interstriatus (Rég. *in litt.*) sp. n. group 12.

4⅞–5 mm. long: 2¼–2½ mm. lat.

Oblongo-ovalis, subparallellus, subdepressus, nigricans, rufo-testaceus; elytris basi apiceque dilutioribus, capite tenuissime subobsolete punctulato, prothorace maris tenuissime sat distincte punctato-striolato, feminae distincte longitudinaliter dense striolato-strigoso; elytris maris striis quinque integris et interstriis quattuor magis interruptis, post medium plus minus

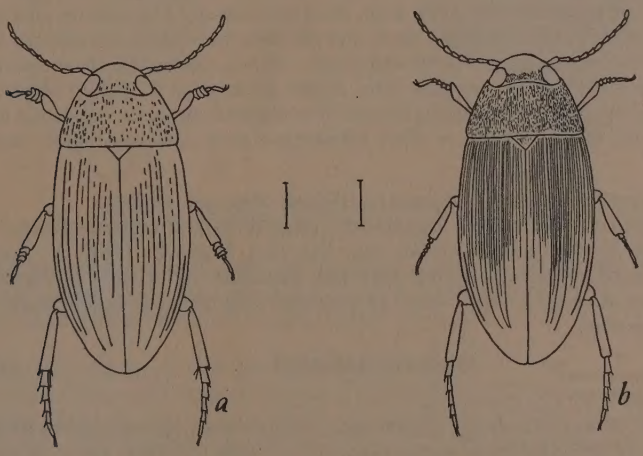

FIG. 13.—*Copelatus interstriatus* sp. n. (a) ♂; (b) ♀.

desinentibus, striis submarginalibus ante medium abbreviatis, pone basin striolis tenuis sparsis, alteraque tenuissime subobsolete punctulato; elytris feminae striis circa viginti-quattuor plus minus integris, striis submarginalibus longis, basi apiceque vix attingente, striis paribus longioribus. Mas, segmentibus tribus basalibus tarsorum anteriorum intermediorumque dilatatis, fere transversis, tibiis anticis apud basin intus emarginatis.

Head, thorax and elytra dark reddish testaceous, the elytra with an obscurely redder basal band and the apex paler. The peculiar sexual dimorphism of the elytral striae is quite unparalleled in the genus. It is evident that the female has developed accessory

striae between the " main " and " inter " striae, whereas the male appears to be evolving in the opposite direction and to be losing the interstriae. The accessory striae of the female are, with the exception of the first two internal ones, well defined and not formed by the anastomosing of linear strioles of the sexual sculpture.

The anterior tibiae of the male are moderately emarginate internally at the base, the distal portion rather abruptly dilated.

♂ holotype, ♀ allotype. AMAZONS (*Bates*) (British Museum, 67–56).

The relationship of this very distinct species is obscure. No other known species exhibits the extreme form of sexual dimorphism shown in this species. The general form is similar to that of *C. laeticulus* Sharp and *C. sharpi* Van den Branden.

Copelatus bakewelli sp. n. group 13.

5½ mm. long : 2 mm. lat.

♀. *Ovalis, latus, minus depressus, nigricans, piceus ; capite, prothorace, et elytris ad basin angustiore, ad latera latiore, rufis, capite inter oculos vage obscuriore, pertenuissime reticulato, tenuissime et remote punctulato ; prothorace in medio infuscato, ad latera strigulis sparsis brevibus, fortiter et bene impressis, pertenuissime vix visibiliter reticulato, tenuissime sat dense punctulato ; elytris nigro-piceis, ad basin angustiore ad latera latiore rufo-ornatis, striis undecim integris, profundis, imparibus brevioribus, striis submarginalibus ante medium abbreviatis. Subtus rufus, segmentibus posticis abdominis infuscatis ; antennis pedibusque rufo-testaceis, his posticis infuscatis. Mas ignotus.*

Head and pronotum reddish, the former between the eyes, the latter with the disc darker. The pronotum with a few deep, short and strongly impressed strioles generally scattered over the whole surface; finely and obscurely punctulate, towards the sides, the small punctures, becoming a little elongated. Elytra piceous, the base narrowly, the sides more widely reddish, the edges of the reddish areas not at all sharply defined. There are eleven deep strong striae reaching from the base almost to the apex, the uneven numbered ones a little shorter behind; a short submarginal stria not extending in front of the middle.

♀ holotype. NORTH AUSTRALIA (British Museum, 67–56).

A distinct new species apparently related to *C. perfectus* Sharp and *C. irregularis* MacLeay (1871, *Trans. ent. Soc. N.S. Wales* **2** : 126). *C. perfectus* is smaller and lighter in colour and the pronotal striolation is distinct. *C. irregularis* is closer in size, but the pronotal striolation is much more copious in that species.

Copelatus papuensis sp. n. group 13.

7–8 mm. long : 3¼–3¾ mm. lat.

Elongato-ovalis, angustulus, subparallellus, subdepressus, nigricans, flavo-piceus, capite rufo-flavo, ad oculos infuscato, thorace nigro, late ad latera rufo-flavo, elytris vel nigro-piceis vel flavo-piceis, striis nigris undecim instructis, striis submarginalibus brevissimis. Subtus nigricans, plus minus nigro-testaceus. Mas, laevigatus, elytris nigricantibus, plus minus late flavo-piceis, striis undecim integris subtilibus instructis, primâ, secundâ, saepe tertiâque anterius plus minus interruptis, caeterum paribus brevioribus. Femina, prothorace, disco excepto laevigato, elytrisque, apicibus exceptis, omnino dense longitudinaliter striolatis, nigris, apicibus flavo-piceis, striis undecim instructis, anterius vix distinctis coram striolis.

Head reddish-yellow, behind the eyes black; pronotum black, the lateral margins more or less widely reddish. In the male the whole pronotum is quite shining, in the female only the disc shining, the lateral margins widely, the anterior and posterior margins narrowly covered with a dense sexual sculpture of short fine longitudinal strioles. The elytra in the

male vary from black, with the base and apex yellowish testaceous to the whole surface pale testaceous; in the female the anterior two-thirds of the elytra black, covered with a dense sculpture of short fine strioles which almost obscures the striae; in the posterior third the apices of the black striae stand out clearly on the smooth yellow surface. The eleven striae in the male are black, or impressed on a black line. Beneath, quite shining in both sexes, infuscate reddish, the antennae and legs reddish testaceous. In the male the anterior tibiae are simple, the basal segments of the anterior and intermediate tarsi broadly dilated, almost transverse, the apical segment stout, the claws long, strong, sharply bent

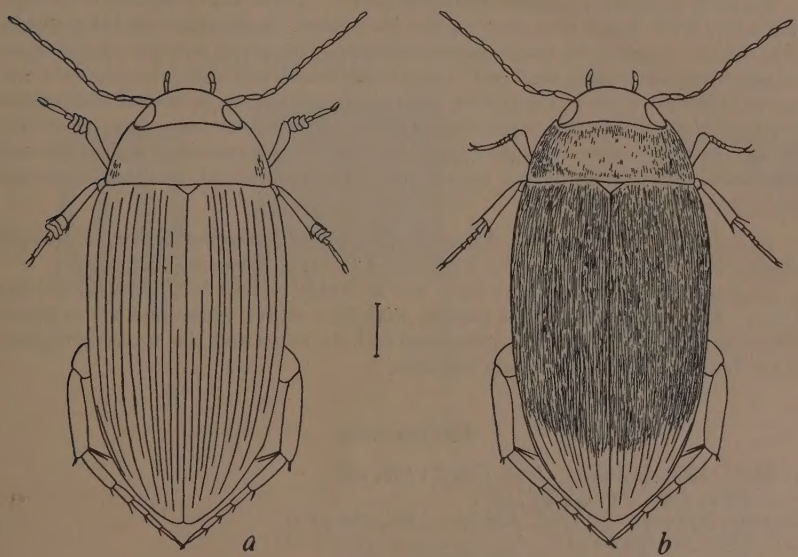

FIG. 14.—*Copelatus papuensis* sp. n. (a) ♂; (b) ♀.

at the base, thereafter almost straight; the apical segment of the intermediate tarsi is very long, gently curved, longer than the first four segments together, the claws simple. In the female the apical segments of both pairs of tarsi are simple.

♂ holotype, ♀ allotype, 14 ♂♂, 10 ♀♀ paratypes, PAPUA: Kokoda, 1200 ft., v.1933 (*Miss Cheesman*) (British Museum, 1933–577).

A very distinct new species with a remarkable development of sexual dimorphism. The species seems isolated, but is perhaps nearest to *C. irregularis* MacLeay.

Copelatus undecimstriatus Aubé. group 13.

C. undecimstriatus Aubé, 1838, *Spec. Col.* **6** : 383.
C. oberthuri Sharp, 1882, *Trans. R. Dublin Soc.* (2) **2** : 594. **syn. n.**

Apparently Sharp did not see authentic specimens of Aubé's species. A comparison of specimens answering perfectly with Aubé's description and Sharp's types proves that these two are conspecific and Sharp's name becomes a synonym.

Copelatus concolorans sp. n. group 13.

4 mm. long : 2 mm. lat.

Elliptico-ovalis, subdepressus, nigricans, piceus, capite prothoraceque rufo-piceis, illo tenuissime punctulato, postice in mare minus, in femina plus, tenuissime striolato, hic pertenuissime et remote punctulato, dense tenuissime longitudinaliter striolato ; elytris sordide rufo-piceis, striis undecim subtilibus sat distinctis, instructis, imparibus paulo brevioribus, striis submarginalibus ante medium abbreviatis ; femina, striolis sexualibus longitudinalibus densis, apicibus exceptis. Subtus, antennis pedibusque rufis.

The whole dorsum is pitchy-red, the elytra darker. The vertex of the head in the male with a few, in the female with more copious fine strioles. Both sexes with the pronotum fairly densely covered with fine longitudinal strioles. The elytra with eleven fine striae, complete from base to apex, the " odd " striae rather shorter and with a submarginal reaching from the apex to about the middle. The female has the elytra covered with a dense sexual sculpture of short fine longitudinal strioles, only the apex being free and shining. The anterior tibiae of the male are simple, the three basal segments of the anterior and intermediate tarsi strongly dilated, the anterior claws strong, sharply deflected downwards close to the base.

♂ holotype, ♀ allotype. British Guiana : Essequibo River, Moraballi Creek, 1929, Oxford University Expedition (British Museum, 1929–485).

This new species is quite distinct, but is closely related to *C. undecimstriatus* Aubé. It is smaller than that species, with finer elytral striae and the presence of fine strioles over the whole pronotum in both sexes and the sexual sculpture of the female are distinguishing features.

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